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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/783,765

02/20/2004

Edward T. Grochowski

42PI8225

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02/01/2007

BLAKELY SOKOLOFF TAYLOR & ZAFMAN
12400 WILSHIRE BOULEVARD
SEVENTH FLOOR
LOS ANGELES, CA 90025-1030

EXAMINER

FENNEMA, ROBERT E

ART UNIT

PAPER NUMBER

2183

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

02/01/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/783,765

Applicant(s)

GROCHOWSKI, EDWARD T.

Examiner

Robert E. Fennema

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2183

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-34 have been considered. Claims 1, 8-10, 18, and 25-27 have been amended as per Applicant's request.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-17, and 27-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Grochowski et al. (United States Patent Application Publication 2001/0023208, herein Grochowski).

4. As per Claim 1, Grochowski teaches: A processor, comprising:

a predicate predictor to determine a predicted predicate value and a confidence value for the predicted predicate value for a first instruction with a predicate (Paragraph 20); and

a micro-op generator to conditionally issue one or more micro-ops from a first set of micro-ops based on the predicted predicate value of said first instruction when said confidence value is high and a sequence of micro-ops that implement the predicate of the first instruction when said confidence value is low (Paragraph 21, if the confidence value is high, it executes a series of microinstructions, and if the confidence value is

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low, it stalls prior to the predicate being resolved, then executes, which involves feeding no-ops to the execution unit, which is a set of micro-ops, as shown by Paragraph 22).

5. As per Claim 2, Grochowski teaches: The processor of claim 1, wherein said first set of micro-ops includes a check micro-op (Paragraph 23).

6. As per Claim 3, Grochowski teaches: The processor of claim 2, wherein said check micro-op is to check for a calculated value of said predicate of true when said predicted predicate value is true (Paragraph 23).

7. As per Claim 4, Grochowski teaches: The processor of claim 3, wherein said check micro-op is to initiate a recovery when said calculated value is false (Paragraphs 28 and 29).

8. As per Claim 5, Grochowski teaches: The processor of claim 3, wherein said first set of micro-ops includes a first micro-op corresponding to said first instruction without predicate (Paragraphs 21-23).

9. As per Claim 6, Grochowski teaches: The processor of claim 2, wherein said check micro-op is to check for a calculated value of said predicate of false when said predicted predicate value is false (Paragraph 23).

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10. As per Claim 7, Grochowski teaches: The processor of claim 6, wherein said check micro-op is to initiate a recovery when said calculated value is true (Paragraphs 28 and 29).

11. As per Claim 8, Grochowski teaches: The processor of claim 1, wherein said sequence of micro-ops includes a micro-op corresponding to said first instruction without predicate (Paragraphs 25-26).

12. As per Claim 9, Grochowski teaches: The processor of claim 8, wherein said sequence of micro-ops includes a conditional move micro-op (Paragraphs 25-26).

13. As per Claim 10, Grochowski teaches: A method, comprising:
determining a predicted predicate value for a first instruction with a predicate (Paragraph 20);

determining a confidence value for said predicted predicate value (Paragraph 20); and

issuing micro-ops corresponding to said first instruction responsive to said confidence value, wherein one or more micro-ops from a first set of micro-ops are conditionally issued based on the predicted predicate value of said first instruction when said confidence value is high and a sequence of micro-ops that implement the predicate of the first instruction when said confidence value is low (Paragraph 21, if the confidence value is high, it executes a series of microinstructions, and if the confidence

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value is low, it stalls prior to the predicate being resolved, then executes, which involves feeding no-ops to the execution unit, which is a set of micro-ops, as shown by Paragraph 22).

14. As per Claim 27, Grochowski teaches: An apparatus, comprising:

means for determining a predicted predicate value for a first instruction with a predicate (Paragraph 20);

means for determining a confidence value for said predicted predicate value (Paragraph 20); and

means for issuing micro-ops corresponding to said first instruction responsive to said confidence value, wherein one or more micro-ops from a first set of micro-ops are conditionally issued based on the predicted predicate value of said first instruction when said confidence value is high and a sequence of micro-ops that implement the predicate of the first instruction when said confidence value is low (Paragraph 21, if the confidence value is high, it executes a series of microinstructions, and if the confidence value is low, it stalls prior to the predicate being resolved, then executes, which involves feeding no-ops to the execution unit, which is a set of micro-ops, as shown by Paragraph 22).

15. As per Claims 11 and 28, with Claim 11 being exemplary, Grochowski teaches:

The method of claim 10, wherein said set of micro-ops includes a check micro-op when said confidence value is high (Paragraph 23). Claim 28 teaches similar limitations and is

rejected for the same reasons.

16. As per Claims 12 and 29, with Claim 12 being exemplary, Grochowski teaches: The method of claim 11, wherein said check micro-op checks for a calculated value of said predicate of true when said predicted predicate value is true (Paragraph 23). Claim 29 teaches similar limitations and is rejected for the same reasons.

17. As per Claims 13 and 30, with Claim 13 being exemplary, Grochowski teaches: The method of claim 12, further comprising initiating a recovery when said calculated value of said predicate is false (Paragraphs 28-29). Claim 30 teaches similar limitations and is rejected for the same reasons.

18. As per Claims 14 and 31, with Claim 14 being exemplary, Grochowski teaches: The method of claim 12, further comprising issuing a first micro-op corresponding to said instruction without predicate (Paragraphs 21-23). Claim 31 teaches similar limitations and is rejected for the same reasons.

19. As per Claims 15 and 32, with Claim 15 being exemplary, Grochowski teaches: The method of claim 11, wherein said check micro-op checks for a calculated value of said predicate of true when said predicted predicate value is false (Paragraph 23). Claim 32 teaches similar limitations and is rejected for the same reasons.

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20. As per Claims 16 and 33, with Claim 16 being exemplary, Grochowski teaches: The method of claim 15, further comprising initiating a recovery when said calculated value of said predicate is true (Paragraphs 21-23). Claim 33 teaches similar limitations and is rejected for the same reasons.

21. As per Claims 17 and 34, with Claim 17 being exemplary, Grochowski teaches: The method of claim 10, wherein said set of micro-ops includes a conditional move micro-op when said confidence value is low (Paragraphs 25-26). Claim 34 teaches similar limitations and is rejected for the same reasons.

Claim Rejections - 35 USC § 103

22. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

23. Claims 18-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grochowski, in view of Foldoc.

24. As per Claim 18, Grochowski teaches: A system, comprising:
a processor including a predicate predictor to determine a predicted predicate value and a confidence value for said predicated predicate value for a first instruction with a predicate (Paragraph 20), and

a micro-op generator to conditionally issue one or more micro-ops from a first set of micro-ops based on the predicted predicate value of said first instruction when said confidence value is high and a sequence of micro-ops that implement the predicate of the first instruction when said confidence value is low (Paragraph 21, if the confidence value is high, it executes a series of microinstructions, and if the confidence value is low, it stalls prior to the predicate being resolved, then executes, which involves feeding no-ops to the execution unit, which is a set of micro-ops, as shown by Paragraph 22), but fails to explicitly teach:

- an interface to couple said processor to input-output devices; and
- an audio input-output coupled to said interface and said processor.

Grochowski teaches a processor used in a computer system, but does not explicitly disclose a coupled input-output device, or specifically, an audio input-output device. However, Foldoc teaches that most computers have four types of hardware components, among them, input-output devices (IO). Foldoc further teaches that input-output devices are used to communicate with the user and the outside world using peripherals. Furthermore, Foldoc discloses that speakers and microphone are common examples of a peripheral, both of which are audio devices. Given the ability to interact with the outside world, and the advantage of being able for the user to interact with the computer via audio, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an input-output device provided by the computer to interface with an audio device.

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25. As per Claim 19, Grochowski teaches: The system of claim 18, wherein said first set of micro-ops includes a check micro-op (Paragraph 23).

26. As per Claim 20, Grochowski teaches: The system of claim 19, wherein said check micro-op is to check for a calculated value of said predicate of true when said predicted predicate value is true (Paragraph 23).

27. As per Claim 21, Grochowski teaches: The system of claim 20, wherein said check micro-op is to initiate a recovery when said calculated value is false (Paragraphs 21-23).

28. As per Claim 22, Grochowski teaches: The system of claim 21, wherein said first set of micro-ops includes a first micro-op corresponding to said first instruction without predicate (Paragraphs 21-23).

29. As per Claim 23, Grochowski teaches: The system of claim 19, wherein said check micro-op is to check for a calculated value of said predicate of false when said predicted predicate value is false (Paragraph 23).

30. As per Claim 24, Grochowski teaches: The system of claim 23, wherein said check micro-op is to initiate a recovery when said calculated value is true (Paragraphs

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21-23).

31. As per Claim 25, Grochowski teaches: The system of claim 18, wherein said sequence of micro-ops includes a micro-op corresponding to said first instruction without predicate (Paragraphs 21-23).

32. As per Claim 26, Grochowski teaches: The system of claim 25, wherein said sequence of micro-ops includes a conditional move micro-op (Paragraphs 25-26).

Response to Arguments

33. Applicant's arguments filed 11/22/2006 have been fully considered but they are not persuasive.

Applicant has made the argument that Grochowski does not teach a sequence of micro-ops to implement the predicate of the first instruction, as the no-ops inserted to stall the pipeline until the predicate is resolved does not constitute implementing the predicate. However, Examiner asserts that the execution of the no-ops, or stalling, does constitute implementing the predicate. The no-ops are inserted into the pipeline to stall the instruction until the predicate is available, at which point it executes as if the predicate had been predicted correctly (see Figure 5). Therefore, when the confidence value is low, a sequence of micro operations are executed which implements the predicate of the instruction, it just takes longer (there are more micro-ops) due to the stalling taking place before the regular execution, the sequence containing a number of

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no-operations at the beginning until the predicate is resolved, a step not necessary when the predicate is predicted, resulting in the difference between a high and low confidence value.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert E. Fennema whose telephone number is (571) 272-2748. The examiner can normally be reached on Monday-Friday, 8:45-6:15.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on (571) 272-4162. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Robert E Fennema
Examiner
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RF



EDDIE CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100